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PROPOSED POLICIES for MARINE PROTECTED AREAS (MPAs)

INTRODUCTION

The Commonwealth's Division of Marine Fisheries (*MarineFisheries*) has developed proposed policies and positions on Marine Protected Areas (MPAs) in state waters and in adjoining federal waters (Exclusive Economic Zone or EEZ). These policies and positions are an outgrowth of our history with MPAs and the current government and public debate about the need for further MPAs in the New England region, especially in the Gulf of Maine (GOM).

Our intent is to engage constituents in constructive discussions regarding our MPA policies especially for *fishery or ecological reserves* - special types of MPAs that can be very restrictive, e.g., no-take zones. Another objective is for *MarineFisheries* to assume a lead role in assisting the New England Fishery Management Council develop its own set of MPA policies. The Council has a long history with MPA implementation in federal waters. *MarineFisheries* is on the Council's MPA Committee.

Furthermore, we want to maximize our contributions to the Stellwagen Bank Sanctuary Advisory Council. The Sanctuary is an MPA. Sanctuary managers are scheduled to develop action plans in response to stakeholders' recommendations for continued and enhanced protection of Sanctuary resources. These action plans will be the basis for a revised Sanctuary management plan scheduled to be completed during summer 2004. One major issue likely to be a focus of that plan will be the impact of fishing gear on marine bottom habitat and fauna. With this already being a *MarineFisheries* management and research concern, our policies might assist the Council develop an appropriate response to this impact ranging from substantial to inconsequential.

On a broader scale there is the Gulf of Maine Council on the Marine Environment with its mission of "maintaining and enhancing environmental quality in the Gulf of Maine and allowing for sustainable resource use by existing and future generations." Although not a member of the Council, *MarineFisheries* advises the Commonwealth's representatives (i.e., Executive Office of Environmental Affairs Secretary and Office of Coastal Zone Management) on issues such as marine habitat protection. With the Council now focusing on MPAs through its GOM Marine Protected Areas Project, *MarineFisheries*' expertise and guidance on this subject will be required and specific policies will be helpful.

Finally, our MPA positions must be clear for the benefit of NOAA that continues to implement Executive Order 13158 requiring the federal government to "significantly strengthen and expand a national system of MPAs." There is now a National Center for Marine Protected Areas. Part of the Center's target audience for an MPA "needs assessment" are marine resource managers. Since there are very few New England state agency fisheries managers on NOAA's Federal Advisory Committee for MPAs, *MarineFisheries* must ensure our views are known and influential.

The following proposed policies are preceded by background information on MPAs to demonstrate our awareness of the many participants in the MPA debate and

their positions. Various publications and workshops have been held on MPAs, and many recommendations have been made. Some of those recommendations relate to state waters' MPAs. Our background information should ensure that MPA proponents and opponents understand *MarineFisheries* is informed about and responsive to the MPA debate.

BACKGROUND

NOAA & MPAs

- NOAA is responsible for implementing Executive Order 13158 on MPAs requiring the federal government to significantly strengthen and expand a national system of Marine Protected Areas (MPAs) by working closely with state, territorial, local, tribal and other stakeholders;
- NOAA has established a 26-member Federal Advisory Committee to provide external advice to the Secretaries of Commerce and Interior on the development of a scientifically-based, comprehensive national system of MPAs, and that committee has just one New England state agency fisheries manager as a member (Maine) and just two Massachusetts representatives—one representing a marine research laboratory and the other a national estuarine reserve;
- The Administration of President George W. Bush continues to be advised to follow President Clinton's lead and to institute a comprehensive program of ocean resource management and protection based on zoning within the U.S., i.e., marine reserves for the protection of marine biodiversity damaged by overfishing and fishing gear, e.g., bottom trawls;[1].
- The Administration of President George W. Bush has retained E.O. 13158 and is appointing a Marine Protected Area Advisory Committee;
- Secretary of Commerce Donald Evans in a June 4, 2001 DOC news release stated "Conservation can be balanced with commercial and recreational activity. It is our stewardship responsibility," and the Secretary referenced the Dry Tortugas in the Florida Keys as a successful, model MPA (i.e., ecological reserve) brought about by a well-planned process and secured grassroots support;

Canada

- Canada's Department of Fisheries and Oceans (DFO) published in March 1999 "National framework for establishing and managing marine protected areas—a working document." DFO reasons for establishing MPAs under the Oceans Act were the conservation and protection of: (1) commercial and non-commercial fishery resources, including marine mammals, and their habitats; (2) endangered or threatened marine species, and their habitats; (3) unique habitats; (4) marine areas of high biodiversity or biological productivity; and (5) any other marine resource or habitat as is necessary to fulfill the mandate of the Minister (of Fisheries and Oceans);
- This Canadian effort emphasized the need for effective partnering and "support of federal ministers, boards and agencies, provincial and territorial governments and affected Aboriginal organizations, coastal communities and other persons and bodies, including those bodies established under land claims agreements;"
- Canada's 2002 Groundfish Management Plan included a 424 km^2 coral conservation closure for all bottom-impacting gear in parts of fishing zones 5Z and 4X (viz., part

of the Northeast Channel between Georges Bank and Browns Bank). According to the DFO in a June 21 news release, "…The closure will protect sensitive habitat from disturbance. No groundfish fishing will be allowed in 90 percent of the area in 2002. Hook and line fishing will be allowed on an authorized basis in the remaining 10 percent. This will provide scientists with the opportunity to study the impacts of fishing on coral. Work aimed at delineating other important deep-sea coral distributions will also continue as part of DFO's research into the marine ecosystem;"

Marine Biodiversity

- Protecting biodiversity is a laudable goal and has been a priority for stewards of land and freshwater environments for many years, especially for ecosystems such as the Florida Everglades, tropical rainforests, and Pacific Northwest old-growth forests;
- According to renowned biologist E.O. Wilson, (1) "The new focus for conservationists is on ecosystems, with their thousands of inconspicuous species, rather than on just individual species such as the panda and redwood;" (2) "Not one species has yet been fully assayed for all of the value it possesses as a commodity, a subject of scientific study, and aesthetic object;" and (3) "Conservationists now place emphasis on the preservation of entire habitats and not only on the charismatic species within them;"[2]
- Environmental ethics extols the following: "The ethical imperative should be prudence: we should judge all forms of biodiversity as priceless, we should not knowingly allow any species or race go extinct, and we should restore natural environments in order to rejuvenate biodiversity;"[2]
- The impetus for protecting biodiversity has been an accelerating rate of species disappearance (extinction) primarily due to habitat loss, pollution, and introduction of exotic species;
- "…biodiversity is important because it embodies the beauty, interest, and richness of life on earth. While this statement carries little weight in the development of environmental policy and management measures, it remains a compelling argument in support of the conservation of biodiversity for all those with a deep appreciation of nature;"[3]
- Protecting biodiversity is a priority of the Commonwealth's Secretary of Environmental Affairs Bob Durand, and that priority has been demonstrated through the Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program that has mapped areas "crucial to the continuing survival of the state's rare species and exemplary natural communities." This 2001 BioMap identifies "elements of biodiversity" and is to guide land conservation (including salt marshes) for biodiversity in Massachusetts;[4]
- At least one prestigious scientific journal officially has expressed concern about conserving biodiversity and ecosystem services. In a March 2001 AAAS journal Science editorial, the editors concluded: "Most conservation research and funding are oriented toward biodiversity with, until recently, little tangible effort being directed toward ecosystem services," i.e., provision of goods, basic life-support services and human enjoyment of nature;

- Protecting biodiversity is an objective that only recently has been applied to marine ecosystems, especially fragile coral reef environments that rival rain forest biodiversity and are threatened by pollution, disease, and overfishing;
- International organizations led by the World Resources Institute, the World Conservation Union (IUCN), and the United Nations Environment Programme (UNEP) have developed a "Global Diversity Strategy," and the Center for Marine Conservation, IUCN, World Wildlife Fund, UNEP, and the World Bank have produced a companion "Global marine biological diversity strategy for building conservation into decision making" for the purpose of "inspiring leaders to protect, study, and sustainably use biological diversity" thereby enabling people to "continue to benefit from the products and services of life on Earth;"[5]
- The National Academy of Sciences' Research Council has published a text, Marine Protected Areas – Tools for Sustaining Ocean Ecosystems (2001) and recommends, "In the design of a system of marine reserves and protected areas, the complete spectrum of habitats supporting marine biodiversity should be included with emphasis on safeguarding ecosystem processes," and notes, "One of the best supported goals of MPAs is to conserve and restore marine biodiversity – that is, to maintain species diversity and the natural balance of species interactions;"
- The catch-phrase "conserving biodiversity" continues to be prevalent in MPA discussions. Fisheries managers' lack of progress or "failures" also fires the MPA movement seeking precautionary fisheries management through large and/or networks of marine reserves or ecosystem reserves – the latter being considered integral by the National Research Council for multispecies fisheries management;
- Lack of knowledge about loss of marine biodiversity is due to anonymity of most marine benthic animals (e.g., sponges, tube worms, and hydrozoans) and insufficient marine habitat monitoring;[6]
- Measurement of biodiversity is hindered by the need to determine the scale of measurement and sample type before various components of biodiversity can be measured (e.g., species richness or evenness); however, none of these measurable components can stand alone as a measure of biodiversity because they are all measured on different scales and in different units. Furthermore, "…for the purposes of fisheries management, neither the very broad-scale or extremely detailed measures of diversity prove useful, practical, or sustainable over the long-term analysis of an area or biological community;"[7]
- Concern about depletion of biodiversity is now a popular issue, but it is difficult to precisely define biodiversity in a functional sense or define the linkage between biodiversity and long-term stability of ecosystems.[6] The definition of biodiversity is ambiguous;
- Ecosystem stability is a vague concept variously defined and interpreted with insufficient and contradictory evidence regarding an ecosystem diversity-stability relationship;[8]
- The New England Fishery Management Council through its MPA Committee is examining biodiversity in the context of fisheries management. That examination continues to involve improving managers' understanding of how to define and measure biodiversity, importance of biodiversity, and challenges for protecting biodiversity. An April 2002 briefing paper concluded: "The application of

biodiversity to management issues ultimately requires the creation of moral and ethical parameters to frame decisions that must be made in a political setting. This will be the greatest challenge in incorporating a working concept of biodiversity into the development of management approaches;"[7]

- Outside of experimental and theoretical work, scientists have yet to determine how biodiversity dynamics, ecosystem processes, and abiotic factors interact. "This is a major challenge which may help bring about a true synthesis of community and ecosystem ecology;"[9]
- Marine biodiversity can be categorized as genetic, species, population, or ecosystem diversity with no specific scientific guidance as to what levels of diversity are desirable and sustainable;
- An ecosystem includes all biotic interactions of a community (populations of different species that live and interact together within an area) and the interactions between organisms and their abiotic environment (e.g., temperature and salinity);[10]

Non-Governmental Organizations (NGOs)

- The National Academy of Sciences' Research Council has concluded that a national system of protected ocean areas (i.e., reserves) would promote an ecosystem-based approach to conservation and management provided there is: (1) coordination among states and the federal government with active input from community, commercial and recreational interests and (2) effective implementation brought about by (a) active participation by all stakeholders at the onset of the design process to determine conservation needs at the local/regional levels and goals/objectives, and (b) an understanding of the probable socioeconomic impacts on local communities with final selection of sites being based on community concerns;
- National Research Council has endorsed the use of MPAs as "additional fishery management tools to be used in combination with, not as a replacement for, traditional means of fishery management." According to the NRC, MPAs have multiple goals and benefits: conserving biodiversity, improving fishery management, protecting ecosystem integrity, preserving cultural heritage, providing educational and recreational opportunities, and establishing sites for scientific research;
- Conservation organizations, such as the Conservation Law Foundation, urge state and federal enactment of MPAs, e.g., "…The importance of a well-designed system of marine protected areas (MPAs) in the Gulf of Maine is that it provides a rational, scientifically driven mechanism to conserve and restore the magnificent biodiversity that should be the fundamental hallmark of the Gulf;"[11]
- The Conservation Law Foundation is promoting the establishment of an MPA system in Gulf of Maine state waters (Massachusetts, New Hampshire, and Maine) "to conserve the region's biodiversity" and has concluded: "By and large, all three states lack deliberately designated sites and specific MPA programs and policies;"[12]
- The Ocean Conservancy (formerly Center for Marine Conservation) evaluated the marine and coastal protected areas in the GOM including Georges Bank, and it analyzed the objectives of those protected areas against those of World Conservation Union (IUCN) Protected Area Management Categories. This analysis and two others led the Conservancy to conclude: (1) "very few sites are designed or managed to provide comprehensive, lasting protection to the full range of marine species and

habitats," (2) "strongest protections are concentrated in small, scattered coastal sites," and (3) "the vast majority of GOM waters lack protected areas of any kind." The Conservancy recommended a comprehensive network of effective, permanent MPAs of different types in coastal and offshore areas, including one area of Ocean Wilderness and some areas permanently closed to all fishing. It also recommended that an effective GOM MPA network should involve the "active participation of fishermen, scientists, coastal communities, conservationists, governments at all levels, and the full range of other stakeholders with an interest in the GOM;"[13]

- The American Association for the Advancement of Science (AAAS) motivated scientists of the National Center for Ecological Analysis and Synthesis (NCEAS) Working Group on Marine Reserves to meet with an Academic Scientist Group at a COMPASS-sponsored (Communication Partnership for Science and the Sea) assembly for the purpose of developing a "scientific consensus statement on marine reserves and marine protected areas;" That assemblage of four NCEAS participants and 161 leading Ph.D. academic institution marine scientists and experts on marine reserves concluded reserves conserve both fisheries and biodiversity; networks of reserves will be necessary for long-term fishery and conservation benefits; and existing scientific information justifies the immediate application of fully protected marine reserves as a central management tool;
- Application of the land wilderness concept to the ocean meets with great resistance perhaps because "the value-laden wilderness term still carries too much terrestrial preservationist baggage for sea areas that are viewed as commons by many. The wilderness ideal is but one point on a conservation continuum ranging from strict preservation to humans as part of nature. The laudable ideal of wilderness has a role in addressing the need for rapid progress in marine conservation, but we should be circumspect in applying the wilderness concept to the sea;"[14]

Gulf of Maine Council on the Marine Environment

- The Gulf of Maine Council on the Marine Environment is comprised of state representatives (Massachusetts, New Hampshire, and Maine), Canadian officials, and the Conservation Law Foundation. It includes federal partners (e.g., NOAA, NMFS, & FWS). Consistent with the Council's mission of "maintaining and enhancing environmental quality in the GOM and allowing for sustainable resource use by existing and future generations," two primary goals are to promote restoration of fishery resources and protect and restore regionally significant coastal habitats. To pursue these goals, the Council has a GOM Marine Protected Areas Project – an international effort to consider a coordinated approach to the establishment of MPAs;
- The Council's GOM MPA Project seeks to consider the establishment of a network or system of MPAs "as a tool to address some of the marine resource issues contributing to the decline of the GOM ecosystem." According to the Project, a MPA network would: (1) "help build a framework for an ecosystem approach to the management of marine resources" and (2) "be consistent with goals and objectives of several existing programs including Canada's Ocean Act, the U.S. Marine Sanctuary Program, and the NMFS Habitat Conservation Program;"
- The Gulf of Maine Council and the Massachusetts Coastal Zone Management Program have concluded that: (1) MPAs can protect biological diversity and

productivity, enhance commercially valuable fish stocks, support marine research and education, protect endangered species, and create areas for tourism and recreation, and (2) GOM MPAs must be planned, implemented, and managed with the participation of all important stakeholders with a "bottom-up" approach involving partnerships of all important stakeholders;

Stellwagen Bank National Marine Sanctuary

- *MarineFisheries* serves as one of six governmental ex-officio members on the new Sanctuary Advisory Council to the GOM Stellwagen Bank National Marine Sanctuary encompassing 842-square miles and "protecting one of the most biologically diverse areas along the eastern seaboard;"[15]
- The Charter of the Advisory Council identifies the Sanctuary, encompassing Stellwagen Bank and Basin, Tillies Bank and Basin, and a portion of Jeffreys Ledge, as "biologically rich," an "intrinsic source of high biodiversity," and "very important to the regional economy as fishing grounds and whale-watching areas;"
- Stellwagen Bank Sanctuary staff have identified "overfishing and use of destructive fishing techniques" as some of the factors threatening biodiversity and habitat range and have concluded that "some of the biodiversity questions facing local researchers include the genetic diversity of whale populations in these waters, species diversity in the face of overfishing, and community diversity after trawling and dredging operations;"[16]
- Stellwagen Bank Sanctuary staff highlighted in the June 2002 "State of the Sanctuary Report" the importance of benthic invertebrates (life on the seafloor): "…Benthic invertebrates occur throughout the Sanctuary across all seafloor habitat types and constitute the major component of biological diversity. While large cerianthid anemones may be the most visible in a deep mud basin, sand dollars and sea stars might dominate the shallower sand areas. Structure-forming epifaunal invertebrates (such as sponges and anenomes) provide critical nursery habitat for juvenile fish of many species (such as Atlantic cod and Acadian redfish), while the greater invertebrate community provides an important source of food for these and many other fish species in the Sanctuary;"
- The "State of the Sanctuary Report" cites on-going research projects including two "ecology of fishes and seafloor" projects "intended to guide informed consideration of the design, location, and effectiveness of potential marine reserves within the Sanctuary." One project is to characterize fish diversity over boulder and gravel habitats compared to sand and mud habitats. The other focuses on cod movement relative to different seafloor habitats;"
- The Sanctuary's June 2002 "Management Plan Review Update: 1998-2002" reminds the public of previous publicly-identified high-profile topics such as "Issue 1: Alteration of seafloor habitat and ecosystem protection." It stated, "Repeated interest was expressed in the use of marine zoning within the Sanctuary as a means to realize specific management goals. A zoning plan would delineate areas within the Sanctuary that limit or exclude particular activities (such as fishing with mobile gear). Part of a zoning plan might involve no-take marine reserves, areas that exclude fishing activity entirely, for a subset of each major seafloor habitat type. Opportunity

exists to work cooperatively with the National Marine Fisheries Service and the New England Fishery Management Council in addressing this issue;"

- The Stellwagen Bank Sanctuary, as all national sanctuaries, has been included as a candidate site for the NOAA MPA list providing the "primary building blocks for a national MPA system;"
- The Florida Keys National Marine Sanctuary, encompassing 9,500 km^2 of submerged lands and waters between the southern tip of Key Biscayne and the Dry Tortugas, including part of Florida Bay and the largest reef system in the continental U.S. (Florida Reef Tract), uses marine zoning as a means to protect biodiversity of the Keys' marine environment with one type of zone being "ecological reserves" to allow areas to return to their natural state;
- The Florida Keys Marine Sanctuary "Ecological Reserves" prohibit fishing by any means and prohibit the removing, harvesting, or possessing of any marine life;
- The Stellwagen Bank Sanctuary is fished by about 250 commercial vessels primarily from Gloucester and Provincetown and small ports in between, and the fishing industry generates about $15.3 million per year from the Bank alone;
- Regulation of commercial and recreational fisheries in the EEZ, including the Stellwagen Bank Sanctuary, is the responsibility of the New England Fishery Management Council, and *MarineFisheries* is a voting member of the Council;

New England Fishery Management Council

- Marine protected areas (MPAs) are well-established fisheries management approaches involving New England seasonal or year-round closures to commercial fishermen fishing with gear capable of catching groundfish;
- The New England Fishery Management Council through its management plans and amendments identifies essential fish habitat and habitat areas of particular concern meriting closures to fishing that impact bottom habitat – a necessary requirement of the Sustainable Fisheries Act;
- The New England Fishery Management Council has the structure and process for dealing with one of the primary reasons for MPA consideration, i.e., fisheries habitat protection;
- Sustainable Fisheries Act-mandated protection is afforded through the Council's Habitat Committee, Habitat Advisory Committee, and Essential Fish Habitat Technical Team all assisting the Council identify essential fish habitat; identify/assess fishing and non-fishing related impacts to fish habitat; define habitat research and information needs; and strategically plan for continued and improved habitat management;
- The New England Council considers newly available habitat-related information, reviews and revises EFH designations, and addresses fishing-related adverse impacts to fish habitat;
- The New England Council emphasized the importance of MPAs by creating an MPA Committee charged to develop a formal Council policy on MPAs and to demonstrate that the Council should be included in all MPA discussions outside the Council process;
- The National Academy of Sciences' Research Council in its 2001 text, <u>Marine Protected Areas – Tools for Sustaining Ocean Ecosystems</u>," recommended MPAs to

improve fisheries management by addressing one or more objectives, i.e., (1) allow depleted fisheries to recover from overfishing; (2) prevent the collapse of fish stocks; (3) improve sustainable yields of fisheries; and (4) reduce bycatch of non-targeted species and undersized individuals of targeted species. These are all responsibilities of the New England Council;

Marine Reserves

- Marine reserves (fishery or ecological reserves) are special types of MPAs that are very controversial, typically permanent, and with a very specific purpose (no-take restrictions). Reserves contrast to areas closed by fisheries managers for extended periods of time to the taking of groundfish or other species and for protection of habitat; i.e., MPAs for fisheries management purposes created by fishery management councils and/or states' fisheries agencies;
- Implementation of the precautionary principle through permanent marine reserves has been suggested as a form of "bet hedging" to reduce risk of a collapse or severe decrease in fish populations caused by overfishing and the inevitable uncertainties, errors, and biases in fisheries management;[17]
- Maintenance of biological diversity and promotion of sustainable fisheries through precautionary adaptive habitat management with no-take MPAs has been touted as the best option when uncertainty is high and the potential for fishing gear-induced, irreversible habitat damage is high;[18]
- The National Academy of Sciences' Research Council concluded, "Marine reserves may provide the only effective means to ensure against overfishing of some species if exploitation is high and there is substantial uncertainty in stock assessments," and "Crises facing many marine ecosystems are increasing and attracting more public attention. Among these are the recent collapse of the Newfoundland cod fishery, the near collapse of the groundfish fishery in New England…;"
- The Stellwagen Bank National Marine Sanctuary has been identified as "New England's flagship MPA" by the Conservation Law Foundation (CLF), and CLF might favor including all or part of the Sanctuary as part of its "permanent safety net against fishery stock collapse by providing protection for 25% of the biomass necessary to support maximum sustainable yields of commercially harvested species in permanently closed areas;"[11]
- There is evidence that within no-take marine reserve boundaries abundance or biomass and average size does increase; however, overall fisheries yield and resilience strongly depends on life history features of target species and their dispersal characteristics at different life stages (affected by the oceanographic setting) leading to transfers between open and closed areas.[19] Furthermore, "…uncertainty associated with critical factors [dispersal] in reserve performance should not be underestimated..., and…It is clear, however, that for more mobile species, the issue of uncertainty in dispersal and distribution and their implications for the protection afforded by a reserve must also be considered and will be central to the predicted performance of the reserve…;"[19]
- Effects of marine reserves on adjacent fisheries have proven positive for two reserves, one in St. Lucia (Caribbean) and another off Florida in the Merritt Island National Wildlife Refuge (adjacent to Kennedy Space Center). The former was to protect

coral reef habitats and relatively sedentary fish species thereby enhancing artisanal, subsistence fisheries. Although the latter had wildlife protection as a subsidiary goal, it resulted in protection of estuarine habitats and relatively mobile species and appeared to lead to record-size fish caught in recreational fisheries adjacent to the reserve;[20]

Division of Marine Fisheries

- *MarineFisheries* has implemented many MPAs throughout its history acting under the authority of M.G.L. Chapter 130, Sections 17 and 17A;
- MPAs exist in waters under the jurisdiction of the Commonwealth from the New Hampshire border to Provincetown. Most of the perimeter of Nantucket sound is an MPA as is a portion of Vineyard Sound close to the beach extending to Cuttyhunk Island. All of Buzzards Bay is an MPA. All estuaries, embayments, salt ponds, tidal creeks and rivers are MPAs;
- Some MPAs have been enacted by the Massachusetts Legislature as far back as the late 1800s to protect spawning and nursery grounds from commercial effort that could concentrate on fishing grounds in coastal embayments thereby reducing fish abundance and worsening user group conflicts;
- MPAs have been adopted by *MarineFisheries* and supported by the Commonwealth's Marine Fisheries Commission for many years as a means to reduce commercial fishing effort on species (e.g., winter flounder) especially vulnerable in waters under the jurisdiction of the Commonwealth;
- Mobile fishing gear such as bottom trawls, sea scallop "dredges," and surf clam/ocean quahog dredges are widely and commonly used commercial fishing gear in Massachusetts and nearby federal waters and are important for the catching of groundfish, especially flounders, whiting, squid, sea scallops, and surf clams/ocean quahogs - finfish and shellfish species of great importance to Massachusetts' commercial fishing economy;
- Use of mobile fishing gear in Massachusetts territorial waters has occurred since the early 1900s with the State Legislature enacting many laws and *MarineFisheries* implementing many regulations to restrict this gear that continues to be controversial regarding its impact on ocean bottom and fisheries habitat;
- *MarineFisheries*' current stance on bottom trawling in state waters has been influenced by a *MarineFisheries* January 1964 Special Report "relative to restricting the use of beam or otter trawling in the taking of fish from certain territorial waters of Massachusetts," with that report (1) referencing a *MarineFisheries*' survey of the literature pertaining to the effect of dragging on bottom life and on the bottom, and (2) concluding that a "program designed to determine quantitatively the effects of trawling on the bottom and on the sessile bottom life of inshore waters would be without precedent.;"
- There are no marine or ecological reserves in waters under the jurisdiction of the Commonwealth. *MarineFisheries*' involvement in current MPA debate stems from its involvement with the New England Fishery Management Council (voting member) and the Stellwagen Bank National Marine Sanctuary (Sanctuary Advisory Council member).

State Agencies

- Massachusetts Office of Coastal Zone Management (OCZM) is involved in MPA debates. For example, in April 1999 CZM co-sponsored a workshop in Freeport, Maine regarding GOM MPAs. Workshop participants developed a "vision statement," eight guidelines for MPAs in the GOM, and four recommendations including the need to begin education and information programs for MPAs. The group recommended using Stellwagen Bank as a case study to demonstrate the effectiveness of generating scientific understanding of an MPA;
- Massachusetts Department of Environmental Management (DEM) administers the Ocean Sanctuaries Act (OSA) established in 1970 and amended in 1989 with new regulations promulgated in 1991. The OSA is designed to protect the Massachusetts' coastal zone through five ocean sanctuaries to "be protected from any exploitation, development or activity that would seriously alter or otherwise endanger the ecology or the appearance of the ocean or seabed. Harvesting of finfish and shellfish are allowed under the Act in all the sanctuaries (North Shore, South Essex, Cape Cod Bay, Cape Cod, and Cape & Islands Ocean Sanctuaries) provided *MarineFisheries* is satisfied that "such activities are carried on in accordance with sound conservation practices;"

Fishing Gear Habitat Impacts

- Concern about the impact of mobile fishing gear on marine bottom habitat and benthic marine life (benthos) continues to increase and intensify with that concern being based on many published studies documenting effects classified as "disruptive, destructive, pronounced, damaging, and long-term;"
- Much of the concern about impact of mobile gear on marine bottom habitat and the benthos is based on European North Sea studies of effects of widely-used beam trawls, not otter trawls, with beam trawls having much more impact due their construction and weight (e.g., 10 mt,12 m-wide trawls with chain mats designed for deep penetration into bottom sediments);
- Beam trawling does not occur in New England waters;
- "Disturbance" of the seabed by mobile gear has been compared inappropriately to forest clear-cutting as part of a sensationalist attempt to condemn all otter trawling as a major threat to fish habitat and marine biodiversity;[21]
- Unjustified wholesale condemnation of mobile gear and wild accusations such as "clear-cutting" the ocean bottom have been prejudicing public opinion against these longstanding ways to fish and making it difficult to separate fact from fiction as opinions become polarized;
- In New England areas where trawling and/or scallop dredging have occurred for many decades, some seascapes appear to have been altered and transformed through shifts to benthic communities capable of withstanding or being unaffected by periodic disturbances cause by passage of the gear. These alterations and transformations are unavoidable consequences of harvest of fish and shellfish vital for commercial fishing economies of many Massachusetts' fishing communities and for the Commonwealth as a whole. For example, in 2000 the ports of New Bedford and Fairhaven ranked number one in the nation for seafood value and most of that value was from sea scallops;

- Sea scallopers of high horsepower can tow large, heavy, and strong dredges to fish for scallops in areas unavailable to lighter gear, and these hard-bottom areas are more likely to have benthic fauna easily damaged by scallop dredges especially large invertebrates, such as sponges, sea anemones, hydroids, and sea urchins;
- Bottom trawlers can tow modified nets in areas where for many years towing was impossible due to gear damage, and these areas can provide complex habitat with hard-bottom communities of marine invertebrates creating habitat 3-D structures potentially serving as nursery areas, shelter, and prey for juvenile fish of many species such as cod and haddock;
- Nets fished by trawlers can be modified to dramatically reduce contact with the bottom, and this reduced contact has been demonstrated clearly through conservation engineering research in cooperation with fishermen (e.g., *MarineFisheries*' raised-footrope trawl);
- Federal requirements to protect fish habitat continue to raise questions about the appropriateness of commonly used fishing gear such as otter trawls and sea scallop dredges sweeping and disturbing the ocean bottom;
- To answer these questions the National Marine Fisheries Service's Northeast Region Essential Fish Habitat Steering Committee held an October, 2001 workshop on the effects of fishing gear on marine habitats off the northeastern U.S.[22] The workshop panel concluded that "the greatest impacts from otter trawls occur in high and low energy gravel habitats and in hard clay outcroppings…" The panel was "unable to reach consensus on the degree of impact for sand and low energy mud habitats…;"
- The EFH Steering Committee recommended that to protect habitat from gear impacts: (a) fishing effort should be reduced and mapped; (b) some closed areas should be closed to all gear types while others only needed to be closed to gear significantly impacting the bottom; (c) Northeast region habitats should be mapped, especially most critical habitats; (d) fishing gear research and modification should be continued; (e) enforcement of closed areas should be improved; (f) damage should be reduced in habitat of low fishery yield; and (g) additional research should be funded including along the continental shelf break, heads of submarine canyons, and in areas with deep-water coral;
- The Ocean Studies Board of the National Academy of Sciences investigated the effects of trawling and dredging on seafloor habitat, and published its findings in a 2002 text.[23] The Board concluded: "…further research will be necessary to fully understand the effects of chronic disturbance by mobile bottom gear and to more accurately assess the effects of habitat disturbance on the productivity of commercial and recreational fisheries." The Board also concluded: "…Habitat complexity is reduced by towed bottom gear that removes or damages biological and physical structures. The extent of the initial effects and the rate of recovery depend on the stability of the habitat…;"
- The Ocean Studies Board recommended: "Management of the effects of trawling and dredging should be tailored to the specific requirements of the habitat and fishery through a balanced combination of the following management tools: 1) Fishing effort reductions. Effort reduction is the cornerstone of managing the ecological effects of fishing, including, but not limited to, effects on habitat…2) Modifications of gear design or gear type. Gear restrictions or modifications that minimize bottom contact

can reduce habitat disturbance…3) Establishment of areas closed to fishing. Closed areas are necessary to protect a range of vulnerable, representative habitats. Closures are particularly useful for protecting biogenic habitats (e.g., corals, bryozoans, hydroids, sponges, seagrass beds) that are disturbed by even low levels of fishing effort…The optimal combination of these management approaches will depend on the characteristics of the ecosystem and the fishery – habitat type, resident seafloor species, frequency and distribution of fishing effort, gear type and usage, and the socioeconomics of the fishery…."

- In August 2002 scientists from the University of Maine's Darling Marine Center scientists/professors, using a remotely operated vehicle, discovered deep-sea coral in the Gulf of Maine 50 miles off the coast of Mount Desert Island. Finding 2-3 centuries old, 3 foot high coral "trees" and thousands of smaller sea fans in about 800 feet of water in Jordan Basin, these researchers continue to explore other areas for corals and have triggered debate about the need for the New England Fishery Management Council to protect coral areas from effects of fishing (i.e., bottom-tending gear and sink gillnets), perhaps through adoption of Coral Conservation Areas similar to those recently implemented by the Canadian government for corals in its DFO 2002 Groundfish Management Plan.

POLICIES/POSITIONS

General

(1) *MarineFisheries* supports MPAs to protect areas or sites from threats to living marine resources from gravel mining, oil drilling, dredge spoil disposal, and other large-scale activities that negatively impact fisheries habitat;

(2) *MarineFisheries* supports modification of existing or creation of new Marine Protected Areas (MPAs) as an appropriate fisheries management and habitat protection approach;

(3) *MarineFisheries* believes that establishing MPAs is a fisheries managers' responsibility when MPAs are used to help rebuild fish stocks, achieve sustainable fisheries yields, and protect essential fish habitat and habitat areas of particular concern;

(4) *MarineFisheries* will not use the misleading acronym "MPA" when the intent is to establish marine reserves (e.g., no-take zones). All marine reserves are MPAs; not all MPAs are marine reserves. This distinction must be made obvious and be maintained to avoid confusing recreational and commercial fishing industries, other stakeholders, and citizenry of the Commonwealth;

(5) *MarineFisheries* considers stakeholder involvement in MPA identification and support for MPA implementation as a critical element for effective MPAs. *MarineFisheries* concurs with the National Research Council recommendations regarding "integrating habitat and resource protection with human needs and values" as part of the process for implementing MPAs, especially marine reserves;[24]

Marine Reserves

(6) *MarineFisheries* supports establishment of marine reserves only when there are very specific, unambiguous, attainable objectives and when there will be effective, timely

monitoring to determine success of reaching reserves' objectives. Those objectives must be consistent with fisheries managers' plans to improve stock status and enhance habitat protection;

(7) *MarineFisheries* does not support marine reserves in the New England area primarily for the purposes of protecting or enhancing biodiversity. This objective, while seemingly laudable and sensible, is too ambiguous and disguises some reserve proponents' true purpose for marine reserves: precautionary fisheries management and a response to their belief that fisheries managers will fail to stop overfishing and rebuild overfished stocks;

(8) *MarineFisheries* does not favor precautionary fisheries management through marine reserves in New England waters. Application of the precautionary principle as a hedge against scientific uncertainty in stock assessments can cause managers to be satisfied or comfortable with uncertain and inadequate basic scientific information since the "simple" implementation of a reserve or network of reserves may free managers from the time and expense of reducing uncertainty. Emphasis must be on reducing scientific uncertainty and not using it as justification for precautionary fisheries management and establishing marine reserves;

(9) *MarineFisheries* opposes the use of reserves for "bet-hedging." The need to include perhaps up to 50% of the original population in order to hedge successfully against overfishing[18] is unnecessarily severe. This guideline, if rigorously applied, ironically would make stock assessments even more uncertain because catch data from fisheries would be skewed, and bottom trawl surveys of abundance - with all their inherent scientific uncertainties - would be almost the sole source of stock assessment information;

(10) *MarineFisheries* opposes establishment of any marine reserve that does not have the support of the New England Fishery Management Council. The Council may conclude that it already has the tools to achieve objectives that some (e.g., National Research Council) feel reserves can address: (a) allow depleted fisheries to recover from overfishing, (b) prevent collapse of fish stocks, (c) improve sustainable yield of fisheries, and (d) reduce bycatch of non-targeted species and undersized individuals of target species. *MarineFisheries* believes the states and New England Council can achieve these objectives shy of having to establish marine reserves;

(11) *MarineFisheries* is critical of marine reserves for fisheries management or habitat protection purposes because they remove fisheries manager's flexibility to change MPA boundaries or allow access to the MPA, as the need arises, e.g., to allow some exploitation of increased biomass of species not the target or motivation for the original MPA designation (such as sea scallops in Georges Bank Closed Area II) or to allow fishing with modified fishing gear having minimal or no affects on habitat;

(12) *MarineFisheries* will cooperate with proponents of MPAs and those seeking marine reserve designations to identify issues, clarify positions, and seek common ground. The burden of proof for establishing marine reserves of any size should be demanding since a reserve(s) likely would preclude commercial and recreational fisheries use of the area(s), and in the case of National Marine Sanctuaries, would not "ensure harmonious use" of resources within a sanctuary – a mandate of the National Marine Sanctuary Program;

Marine Wilderness

(13) *MarineFisheries* is unconvinced that a "wilderness" area or national park designation is appropriate for any New England marine environment, including the suggested "Gulf of Maine International Ocean Wilderness" – a 20-mile wide band of ocean along the Hague Line separating U.S. from Canadian waters. This interesting concept is being spearheaded by the American Oceans Campaign (AOC) and other environmental groups. The view that ocean wilderness should involve protection of all marine creatures down to the smallest plankton is attractive. However, it is impractical in the New England region where there are ocean currents, wide seasonal swings in ocean temperature and abundance of many marine organisms (such as phytoplankton and zooplankton), and fish exhibiting extensive inshore-offshore and north-south movements/migrations. The Ocean Wilderness Challenge made by The Ocean Conservancy (formerly Center for Marine Conservation), seeking to establish at least 5% of U.S. ocean territory as wilderness, is inappropriate for New England waters;

Marine Biodiversity

(14) *MarineFisheries* acknowledges the importance of applying the concept and catch-word of biodiversity as an appropriate lever for protecting land and marine ecosystems such as old-growth forests and coral reefs, but maintains that the sought-after level of difficult-to-measure marine biodiversity (categorized as genetic, species, population, or ecosystem diversity) must be preceded by a determination of what levels of biodiversity by category are desirable and sustainable. There must be debate about what levels of species richness, evenness, composition, and interactions (four components of species diversity) are desirable;

(15) *MarineFisheries* is unconvinced that overfishing of any species in New England waters threatens biodiversity however it may be defined. To threaten biodiversity on commercial and recreational fishing grounds, fishing would have to cause biological extinction or dramatic and undesirable shifts in species composition with irreversible changes in ecosystem structure. *MarineFisheries* awaits evidence that either is possible on New England fishing grounds;

Marine Fisheries Management

(16) *MarineFisheries* believes relatively easy-to-enforce, large, and permanent closed areas (MPAs, but not reserves), subject to fisheries managers' timely revision in shape and size, will continue to be an important fisheries management tool to reduce fishing mortality and stop overfishing especially when latent fishing effort is large and direct controls on fishing mortality are inadequate;

(17) *MarineFisheries* does not accept the postulate that federal waters fisheries management through the fishery management council process, in which *MarineFisheries* participates, will be unable to comply with the National Standards of the Sustainable Fisheries Act, or reserves are the way to achieve that compliance;

(18) *MarineFisheries* will not adopt an attitude that implies the best if not the only way to achieve fisheries management objectives consistent with the National Standard guidelines is to permanently close (i.e., reserve) very large portions of the ocean and important fishing grounds to most if not all forms of fishing. Large reserves or

networks of reserves tend to ignore clear consequences of large, long-term closed areas (e.g., shift of fishing effort to open areas) and the fact that there is no substitute for fisheries managers (1) significantly and permanently reducing fishing effort (including latent effort); (2) dramatically postponing age-at-first-capture through fishing gear modifications or restrictions, (3) providing substantial seasonal protection of spawning fish; and (4) drastically reducing bycatch and discard;

Stellwagen Bank National Marine Sanctuary

(19) *MarineFisheries*, through its participation on the Stellwagen Bank Sanctuary Advisory Council, will focus on Sanctuary staff's expressed concern that (1) overfishing and use of destructive fishing techniques are some of the factors threatening biodiversity and habitat range, and (2) some of the biodiversity questions facing local researchers include species diversity in the face of overfishing and community diversity after trawling and dredging operations. *MarineFisheries* does not classify bottom trawling and/or sea scallop dredging in the New England area as "destructive" fishing techniques threatening biodiversity, although *MarineFisheries* does believe there are areas where trawling and dredging are ill-advised, and other fishing gear or modified trawls/dredges should be used;

(20) *MarineFisheries* does not support establishing all or portions of the Stellwagen Bank National Marine Sanctuary as a marine reserve for fisheries management purposes. Any closures within the Sanctuary for these purposes should be established by the New England Council sanctioned by the Sanctuary Advisory Council;

Mobile Gear Impact on Habitat

(21) *MarineFisheries* acknowledges that bottom fishing gear used for many decades in the New England region can affect fisheries habitat and can have an impact on epifauna such as hydrozoans, bryozoans, tube-building worms, and sponges. For this reason *MarineFisheries* continues to support MPAs in areas where this epifauna, if undisturbed by bottom fishing activity, will become established and grow providing significant and widespread 3-dimensional habitat structure for juvenile fish, especially groundfish. This habitat is most likely to have the greatest positive effect on juvenile survival in hard-bottom areas (cobble-sized gravel and larger) capable of withstanding disrupting forces (e.g., waves and storms) that churn and disperse sediments and prevent sustained attachment/growth of marine organisms. The challenge is to identify that habitat and to determine how much and where protection is warranted;

(22) *MarineFisheries* accepts impacts of bottom trawling and sea scallop dredging in most New England fishing grounds comprised of sand, mud and different mixtures of the two, as an inevitable consequence of catching valuable fish and shellfish sustaining very large economic benefits from landings of the Commonwealth's seafood industry. *MarineFisheries*' acceptance is based, in part, on our belief that bottom trawl and dredging impacts are neither massively destructive nor a major threat to fish habitat and marine biodiversity in the New England region. The "destructive" characterization appears to have originated primarily from the belief that trawling can cause massive destruction of physical and biological features of habitat (e.g. "clear-cutting") thereby dramatically and permanently changing marine

ecosystem structure and function. This description, while quite appropriate for coral reefs, mangroves, kelp forests, sea grass meadows, and other very sensitive marine ecosystems, is inappropriate for most areas in New England where commercial fishing commonly occurs. Although trawling and scallop dredging can change or alter the seascape in sand and mud, that shift in faunal composition or structure is reversible;

(23) *MarineFisheries* continues to be strongly committed to research on effects of fishing gear on marine bottom habitat and on how to minimize any impact, as evidenced by *MarineFisheries*' longstanding Conservation Engineering Program. This research is an agency high priority as evidenced by our current research program, plans for expansion, and purchase of advanced sonar equipment to characterize bottom habitat in state waters;

(24) *MarineFisheries* will: (a) continue to promote use of the raised footrope bottom trawl and the sweepless trawl, developed by *MarineFisheries* in cooperation with fishermen, as a viable option for keeping trawls off bottom and minimizing impact on marine habitat, and (b) promote disincentives for fishermen to fish the trawl improperly or not use the gear as designed. These disincentives will include prohibitions on possession of lobster, monkfish, and other bottom-dwelling species of high value.

(25) *MarineFisheries* will encourage use of small-diameter roller gear (spinning rubber disks) instead of rockhopper gear. The latter gear is of fixed rubber disks allowing a trawl sweep to twist or spring (hop) over rocks more than one meter in diameter.[26]

(26) *MarineFisheries* supports collaboration with fishermen to determine areas where rockhopper gear should be prohibited and small-diameter roller gear or cookie sweeps should be allowed to reduce trawlers' ability to fish on rocky and irregular bottom.

(27) *MarineFisheries* supports fisheries habitat research but prefers that research to occur in areas already closed to bottom trawling and dredging for fisheries management purposes. In areas where habitat research is occurring, closures should be extended until research is completed provided investigators can demonstrate their research is in progress and on a predetermined schedule working towards a termination deadline;

(28) *MarineFisheries* supports establishment of new temporary MPA habitat research areas (a) when it can be demonstrated there are no other suitable alternative sites in existing closed areas for that research and (b) provided a plan for that research makes a convincing and compelling case that experimental results will enable fisheries managers to improve their protection of fisheries habitat.

(29) *MarineFisheries* supports establishment of Coral Protection Areas (Coral MPA) by the New England Fishery Management Council and will have a leadership role in protecting deep sea corals from impacts of bottom trawls, gillnets, longlines, lobster pots, fish pots and other bottom-tending fishing gear, including hook fishing for groundfish and other bottom-dwelling fish and invertebrates.

(30) *MarineFisheries* considers submerged aquatic vegetation (SAV), such as eel grass and widgeon grass, to be essential for high production and sustainability of marine fishery resources and, as a consequence, supports the ASMFC June 1997 SAV policy[25] developed with *MarineFisheries* input. That policy developed to

communicate the need for conservation of coastal SAV resources has a goal of preserving, conserving, and restoring SAV with the intent to: (a) achieve a net gain in SAV distribution and abundance along the Atlantic coast and tidal tributaries, and (b) prevent any further losses of SAV in individual states. MPAs (i.e., year-round closures of SAV beds) will be favored as a mitigation strategy to prevent impacts of fishing gear.

(31) *MarineFisheries*, in support of the ASMFC SAV policy, will help cities and towns reduce negative impacts of shellfish dredge (e.g., scallop and quahog) fisheries in areas of SAV resources. This will include working with town shellfish managers and persuading fishermen, as well as boaters, through a public information/education program to voluntarily reduce their interactions with SAV. This approach is consistent with *MarineFisheries*' limited authority over town-controlled shellfisheries, except for control of cultured or contaminated shellfish stock and for most sea clam fisheries. MPAs (i.e., year-round closures of SAV beds) will be favored as a strategy for cities and towns to consider for sea clam fisheries (i.e., surf clams and ocean quahogs).

(32) *MarineFisheries* will continue its policy of protecting eelgrass beds from impacts of bottom trawling by strengthening existing regulations implemented for that purpose and expanding bottom trawling prohibitions to areas with SAV resources. *MarineFisheries* will work with fishermen to identify those SAV areas and to assist development of mitigation strategies, including MPAs.

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